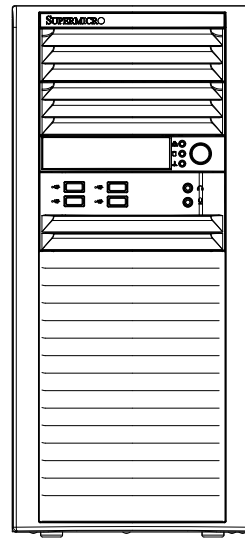
SUPERMICRO®

SuperWorkstation

5037A-I



USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperWorkstation 5037A-I. Installation and maintenance should be performed by experienced technicians only.

The SuperWorkstation 5037A-I is a high-end system based on the SC732D4-903B mid-tower chassis and the X9SRA motherboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a list of the main components included with the system and describes the main features of the X9SRA motherboard and the SC732D4-903B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to set up the SuperWorkstation 5037A-I and to check out the server configuration prior to powering-up the system. If your system was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperWorkstation 5037A-I.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X9SRA motherboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC732D4-903B chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Error Beep Codes

Appendix B: UEFI BIOS Recovery Instructions

Appendix C: System Specifications

Notes

Table of Contents

Chapter 1 Introduction

1-1 Overview 1-1
1-2 Motherboard Features 1-2
Processors 1-2
Memory 1-2
SATA 1-2
PCI Expansion Slots 1-2
Onboard Controllers/Ports 1-2
1-3 Chassis Features 1-2
System Power 1-3
SATA Support 1-3
Front Control Panel 1-3
Cooling System 1-3
Contacting Supermicro 1-5

Chapter 2 Installation

2-1 Overview 2-1
2-2 Unpacking the System 2-1
2-3 Preparing for Setup 2-1
Choosing a Setup Location 2-2
Server Cautions 2-2

Chapter 3 System Interface

3-1 Overview 3-1
3-2 Control Panel Buttons 3-1
Power 3-1
Reset 3-1
3-3 Control Panel LEDs 3-2

Chapter 4 System Safety

4-1 Electrical Safety Precautions 4-1
4-2 General Safety Precautions 4-2
4-3 ESD Precautions 4-3
4-4 Operating Precautions 4-4

Chapter 5 Advanced Motherboard Setup

5-1 Handling the Motherboard 5-1

Cautions 5-1
Unpacking 5-2
5-2 Motherboard Installation 5-2
5-3 Connecting Cables 5-3
Connecting Data Cables 5-3
Connecting Power Cables 5-3
Connecting the Control Panel 5-3
5-4 I/O Ports 5-4
5-5 Processor and Heatsink Installation 5-5
Installing an LGA 2011 Processor 5-5
Installing a CPU Heatsink 5-8
Removing the Heatsink 5-9
5-6 Installing Memory Modules 5-10
Installing and Removing DIMMs 5-10
5-7 Adding PCI Add-On Cards 5-12
5-8 Motherboard Details 5-13
5-9 Connector Definitions 5-15
5-10 Jumper Settings 5-22
5-11 Onboard Indicators 5-25
5-12 SATA Ports 5-26
5-13 Installing Software 5-27
SuperDoctor III 5-28
5-14 Motherboard Battery 5-30

Chapter 6 Advanced Chassis Setup

6-1 Static-Sensitive Devices 6-1
Cautions 6-1
Unpacking 6-1
Installation Instructions 6-2
6-2 Removing the Power Cord 6-2
6-3 Front Control Panel 6-4
6-4 Removing the Chassis Side Covers 6-5
6-5 System Fans 6-6
Fan Failure 6-6
Replacing Chassis Cooling Fans 6-6
6-6 Drive Installation 6-8

6-7 Removing and Installing Optional 2.5" Hard Drives 6-11
6-8 Power Supply 6-13

Chapter 7 BIOS

7-1 Introduction 7-1
Starting BIOS Setup Utility 7-1
How To Change the Configuration Data 7-1
How to Start the Setup Utility 7-2
7-2 Main Setup 7-2
7-3 Advanced Setup Configurations 7-4
7-4 Event Logs 7-20
7-5 Security Settings 7-22
7-6 Boot 7-23
7-7 Save & Exit 7-24

Appendix A BIOS Error Beep Codes

Appendix B UEFI BIOS Recovery Instructions

Appendix C System Specifications

Chapter 1

Introduction

1-1 Overview

The 5037A-I is a high-end workstation comprised of two main subsystems: the SC732D4-903B mid-tower/4U chassis and the X9SRA Intel® Xeon® processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperWorkstation 5037A-I (www.supermicro.com). In addition to the motherboard and chassis, various hardware components have been included with the SuperWorkstation 5037A-I, as listed below:

One (1) Rackmount kit (MCP-290-00053-0N)

- One 12 cm exhaust fan (FAN-0124L4)

- SATA Accessories
  Four 3.5" SATA HDD bays in a 90° rotating hard drive cage

- Optional:
  Four 2.5" HDD/SSD drives
  SATA cable (CBL-179L)
  DVD-ROM drive
  Active CPU heatsinks (SNK-P0050AP4)
  SATA power adapter (CBL-0082L)
  Black 5.25" LCD tray, supports 1x 3.5" HDD (MCP-220-00095OB
  HDD/SDD drive cage (MCP-220-73201-ON) supporting four 2.5" HDDs.
  Active CPU heatsink (SNK-P0050AP4)
  DVD-ROM drive
  SATA cable (CBL-179L)
  SATA power adapter (CBL-0082L)
  One 12 cm "Whisper Quiet" system cooling fan

1-2 Motherboard Features

At the heart of the SuperWorkstation 5037A-I lies the X9SRA, a single processor motherboard based on the Intel® C600 series chipset. Below are the main features of the X9SRA. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9SRA supports an Intel E5-1600/E5-2600 series processor (2011-pin Socket R). Please refer to the motherboard description pages on our Web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9SRA features up to 256GB RDIMM or 64GB UDIMM; DDR3 up to 1600MHz See Chapter 5 for details.

SATA

A SATA controller is integrated into the chipset to provide a Serial ATA subsystem. The 5037A-I (X9SRA) supports two SATA 3.0 and eight SATA 2.0 ports.

PCI Expansion Slots

The X9SRA has features the following PCI expansion slots:
Two (2) PCI-Express 3.0 x16 Slot, one (1) PCI-Express 3.0 x4 in x8 Slot, one (1) PCI-Express 2.0 x4 in x8 Slot and one (1) PCI 33MHz Slot.

Onboard Controllers/Ports

The color-coded I/O ports include eight (8) USB 2.0 ports on the rear I/O panel Six (6) USB 2.0 headers for front panel access, two (2) USB 3.0 (5Gb/s) headers for front panel access, two (2) USB 3.0 (5Gb/s) ports on the rear I/O panel PS/2 mouse and keyboard ports, two (2) Fast UART 16550 connections on two headers (COM1 & COM2).

1-3 Chassis Features

The 5037A-I is a mid-tower chassis with Whisper Quiet operation. The following is a general outline of the main features of the SC743D2-903B chassis.

System Power

The 5037A-I features a single 900W Gold Level multi-outlet power supply with PMBus, ideal for use in a workstation environment.

SATA Support

The SC732D4-903B chassis was designed to support four 3.5" SATA hard drives and four optional 2.5" hard drives.

Front Control Panel

The control panel on the 5037A-I provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, overheat conditions and power supply failure. A main power button and a system reset button are also included.

Note: The power supply fail LED indicates the power supply fan has failed.

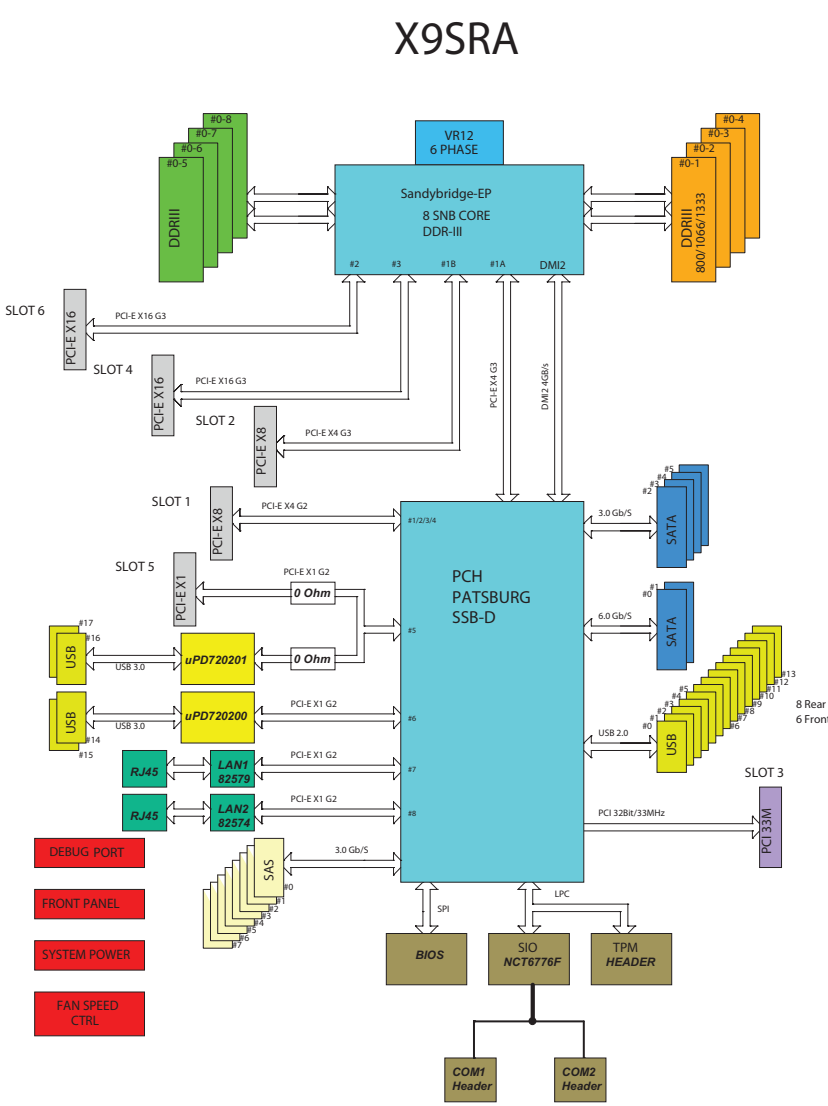
Cooling System

The SC732D4-903B chassis has an innovative "Whisper Quiet" cooling design that provides sufficient cooling at very low noise level - ideal for a workplace environment. The chassis includes one 12-cm exhaust fan located at the rear of the chassis, and one 12-cm optional system cooling fan in the middle of the chassis.

The power supply has one internal fan for redundancy; if this fan fails, the power supply must be replaced. See details in Chapter 6.

Figure 1-1. Intel C600 Chipset:
System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



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Notes

Chapter 2

Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 5037A-I up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processor and memory preinstalled. If your system is not already fully integrated with a motherboard, processor, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components. Please read the Server Precautions in the next section before using the system for the first time.

2-2 Unpacking the System

You should inspect the box the system was shipped in and note if it was damaged in any way. If the system itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the SuperWorkstation. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the system was shipped in may include two sets of rail assemblies, two rail mounting brackets and mounting screws needed for installing the system into a rack (optional kit). Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Server Cautions

- Review the electrical and general safety warnings in Chapter 4.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot-plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Additional warnings and cautions may also be found on the Supermicro Web site at http://www.supermicro.com/about/policies/safety_information.cfm.

Chapter 3

System Interface

3-1 Overview

The control panel on the 5037A-I has several LEDs and two buttons. There are also two LEDs on each hard drive carrier. These LEDs keep you constantly informed of the overall status of the system and the activity and health of specific components.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis: a power on/off button and a reset button.

Power

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

Reset

Use the reset button to reboot the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC732D4-903B chassis has three LEDs that provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

NIC: Indicates network activity on GLAN when flashing.

HDD: Indicates IDE channel activity in the SAS/SATA drive, and/or DVD-ROM drive activity when flashing.

Overheat/Fan Fail
When Flashing: This LED indicates a fan failure.
When Continuously On (not flashing): This LED indicates an overheat condition caused by cables obstructing the airflow in the system or the ambient room temperature being too warm.

Correcting an Overheat/Fan Fail Condition

1. Check the routing of the cables and move any cables that restrict airflow.
2. Confirm that all fans are operating normally.
3. Verify that the heatsinks are installed properly.
4. If the chassis cover is not aligned correctly, the airflow may be disrupted. This leads to overheating. Confirm that the chassis cover is placed correctly.
5. This LED will remain active as long as the overheat condition exists.

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperWorkstation 5037A-I from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high-voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and the DVD-ROM. When disconnecting power, you should first power down the system with the operating system. The unit has more than one power supply cord. Disconnect both power supply cords before servicing to avoid electrical shock.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.

- Motherboard battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the SuperWorkstation 5037A-I clean and free of clutter.

- The 5037A-I weighs approximately 29.5 lbs (13.38 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs. Don't use the handles (if installed) to lift the chassis; the handles should only be used to pull the server out of the rack.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

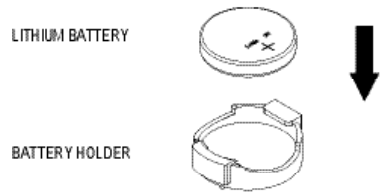
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the system is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Motherboard Setup

This chapter covers the steps required to install the X9SRA motherboard into the chassis, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the motherboard to better cool and protect the system.

5-1 Handling the Motherboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Cautions

- Use a grounded wrist strap designed to prevent electrostatic discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Motherboard Installation

This section explains the first step of physically mounting the X9SRA into the SC732D4-903B chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the motherboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by laying the chassis on a flat surface, removing the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. Make sure that the I/O ports on the motherboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Carefully mount the motherboard to the motherboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

4. Insert screws into all the mounting holes on your motherboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the motherboard ground to provide a continuous ground for the system.

5. Finish by reinstalling the top cover onto the chassis.

Caution: To avoid damaging the motherboard and its components, do not apply any force greater than 8 lbs. per square inch when installing a screw into a mounting hole.

5-3 Connecting Cables

Now that the motherboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- SATA drive data cables (I-SATA0 ~ I-SATA5)
- Control panel cable (JF1)
- SGPIO cable (T-SGPIO1, T-SGPIO2)

Caution: Make sure that the cables do not come into contact with the fans.

Connecting Power Cables

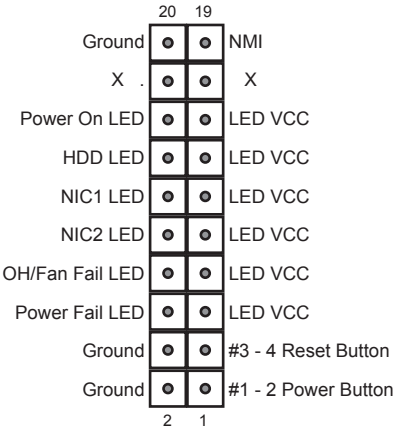
The X9SRA has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, the 8-pin secondary power connector (JPWR2) must also be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

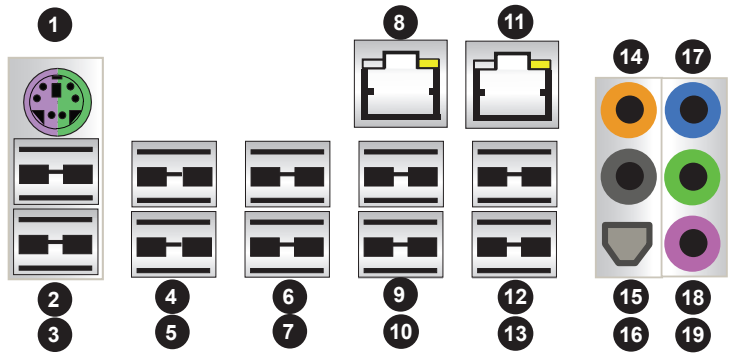
All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.



Motherboard I/O Backpanel		
1. Keyboard/Mouse	7. USB 2.0 Port 5	13. USB 2.0 Port 7
2. USB 2.0 Port 0	8. LAN 1 Port	14. Center/LFE Out
3. USB 2.0 Port 1	9. USB 3.0 Port 0	15. Surround Out
4. USB 2.0 Port 2	10. USB 3.0 Port 1	16. S/P DIF Out
5. USB 2.0 Port 3	11. LAN 2 Port	17. Line In
6. USB 2.0 Port 4	12. USB 2.0 Port 6	18. Line Out
		19. Mic In

5-5 Processor and Heatsink Installation

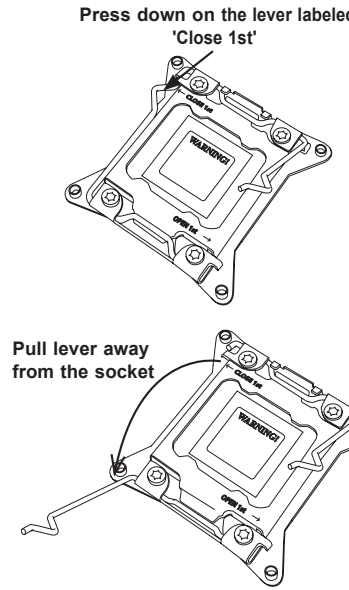
Caution: When handling the processor package, avoid placing direct pressure on the label area of the fan.

Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the motherboard into the chassis before you install the CPU heatsinks.
- When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro Web site for updates on CPU support.

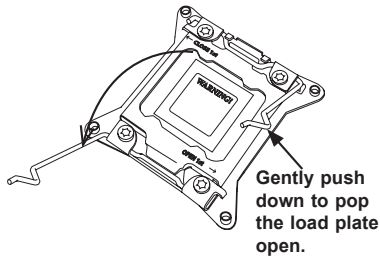
Installing an LGA 2011 Processor

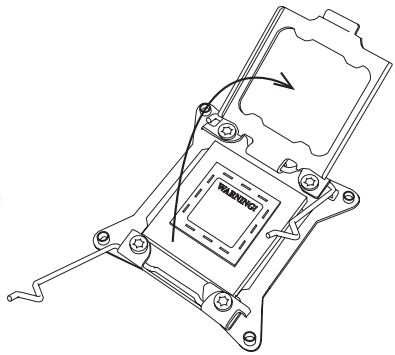
1. There are two levers on the LGA2011 socket. First press and release the load lever labeled 'Open 1st'.
2. Press the second load lever labeled 'Close 1st' to release the load plate from its locked position.



3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.

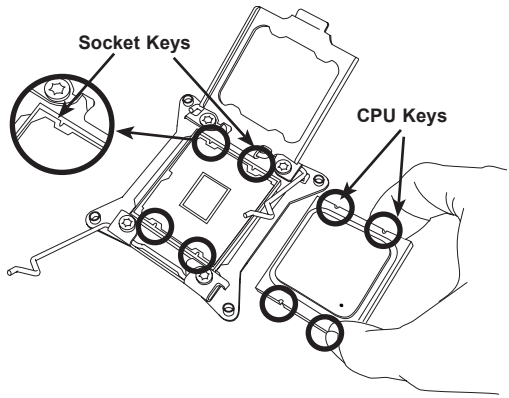
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.





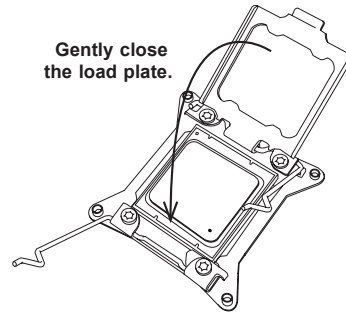
5. Use your thumb and index finger to hold the CPU by its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.

6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically and do not rub the CPU against any pins of the socket, which may damage the CPU or the socket.)

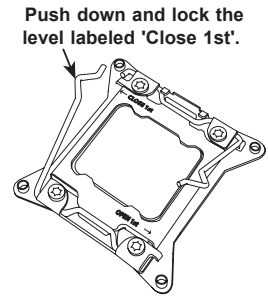


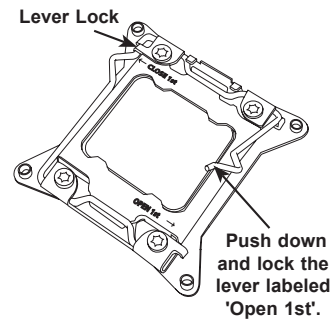
Caution: You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

7. With the CPU in the socket, inspect the four corners of the CPU to make sure that they are flush with the socket.



8. Close the load plate. Lock the lever labeled 'Close 1st', then lock the lever labeled 'Open 1st'. Use your thumb to gently push the load levers down until the lever locks.





Installing a CPU Heatsink

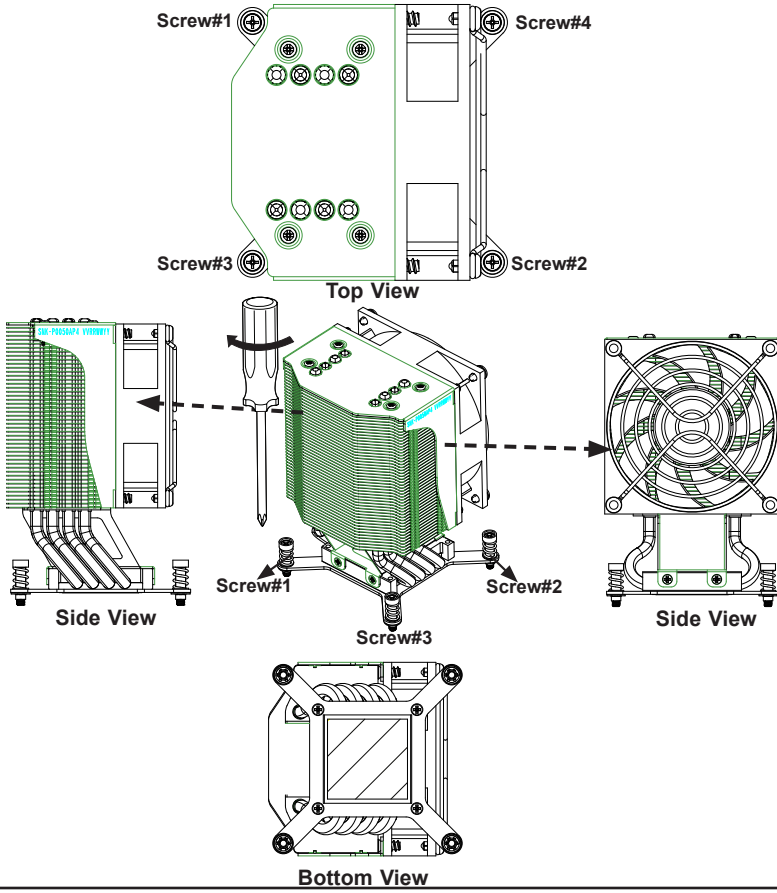
Caution: Remove the power cord before installing heatsinks. Do not reconnect it until the installation is completed. See http://www.supermicro.com/about/policies/safety_information.cfm.

1. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the heatsink bracket underneath.

3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug. (To avoid possible damage to the CPU do not over-tighten the screws.)

4. Finish the installation by fully tightening all four screws.



Removing the Heatsink

Caution: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket. Additional warnings and cautions can be found on the Supermicro Web site at http://www.supermicro.com/about/policies/safety_information.cfm.

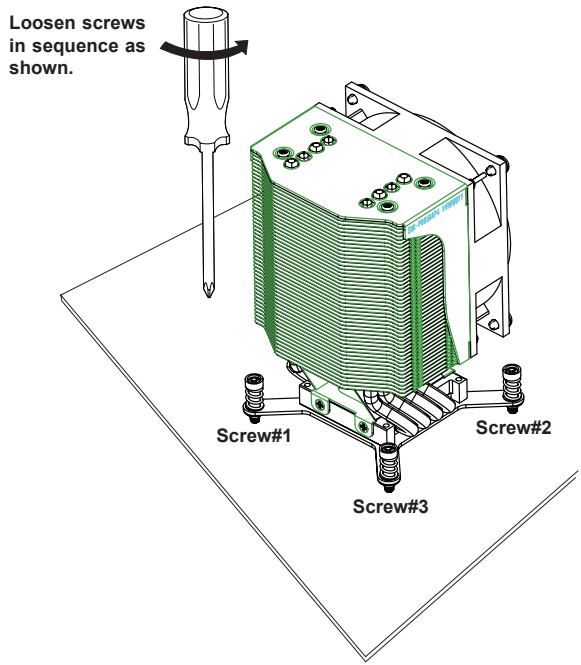
1. Remove the power cord from the system before removing the heatsink.

2. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.

3. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)

4. Once the heatsink is loosened, remove it from the CPU socket.

5. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the heatsink.



5-6 Installing Memory Modules

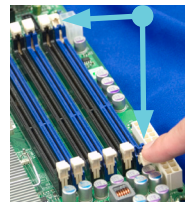
Note: Check the Supermicro Web site for recommended memory modules.

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

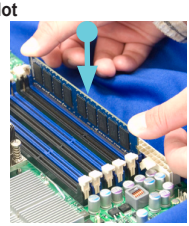
Installing and Removing DIMMs

Press down the release tabs



1. Insert the desired number of DIMMs into the memory slots, starting with P1 DIMM1A. For best performance, please use the memory modules of the same type and speed in the same bank.See the DIMM Installation Chart on the following page.

Insert & press a DIMM into the slot



2. Press down the release tabs on the ends of a memory slot. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.

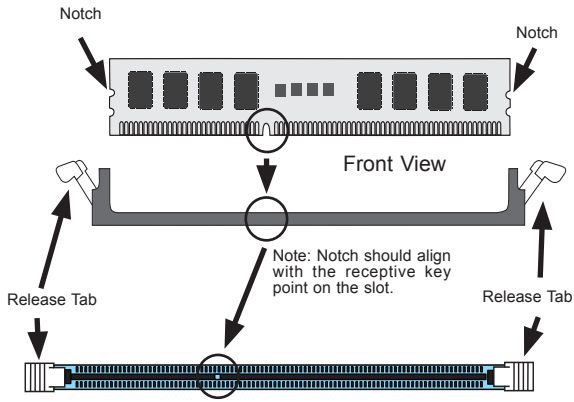
3. Using both thumbs, gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

4. Reverse the steps above to remove the DIMM modules from the motherboard.

Figure 5-3. DIMM Installation

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



Memory Support

The X9SRA supports up to 256 GB of 1600/1066/1333/1600 MHz ECC/Non-ECC DDR3 DIMMS in eight memory slots. For the latest memory updates, please refer to the product page on the Supermicro Web site.

Order of Populating DIMM Slots

For memory to work properly, follow the table below for the correct order of populating the DIMM slots. See the serverboad layout page for slot numbering.

Notes: an "X" indicates a slot populated with a memory module.

Populate the "A" DIMM slots first. Any of the slots may be used. Populate the "B" slots only after all "A" slots have been filled.

Recommended Population (Balanced)								
DIMM1A	**DIMM2A**	**DIMM3A**	**DIMM4A**	**DIMM1B**	**DIMM2B**	**DIMM3B**	**DIMM4B**	**Total System Memory**
2GB	2GB							4GB
2GB	2GB	2GB	2GB					8GB
2GB	2GB	2GB	2GB	2GB	2GB			12GB
2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	16GB
4GB	4GB							8GB
4GB	4GB	4GB	4GB					16GB
4GB	4GB	4GB	4GB	4GB	4GB			24GB
4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	32GB
8GB	8GB							16GB
8GB	8GB	8GB	8GB					32GB
8GB	8GB	8GB	8GB	8GB	8GB			64GB
8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	128GB
16GB	16GB							32GB
16GB	16GB	16GB	16GB					64GB
16GB	16GB	16GB	16GB	16GB	16GB			96GB
16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	128GB
32GB	32GB							64GB
32GB	32GB	32GB	32GB					128GB
32GB	32GB	32GB	32GB	32GB	32GB			192GB
32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	256GB

Note: Up to 256GB of memory are supported using ECC QR (Quad Rank or 4-Rank) registered DIMM technology at 1600/1333/1066/800 MHz. Up to 64GB of memory are supported using non-ECC UDIMMs.

5-7 Adding PCI Add-On Cards

The 5037A-I can accommodate standard size add-on cards populated in all slots on the X9SRA motherboard.

Installing an Add-on Card

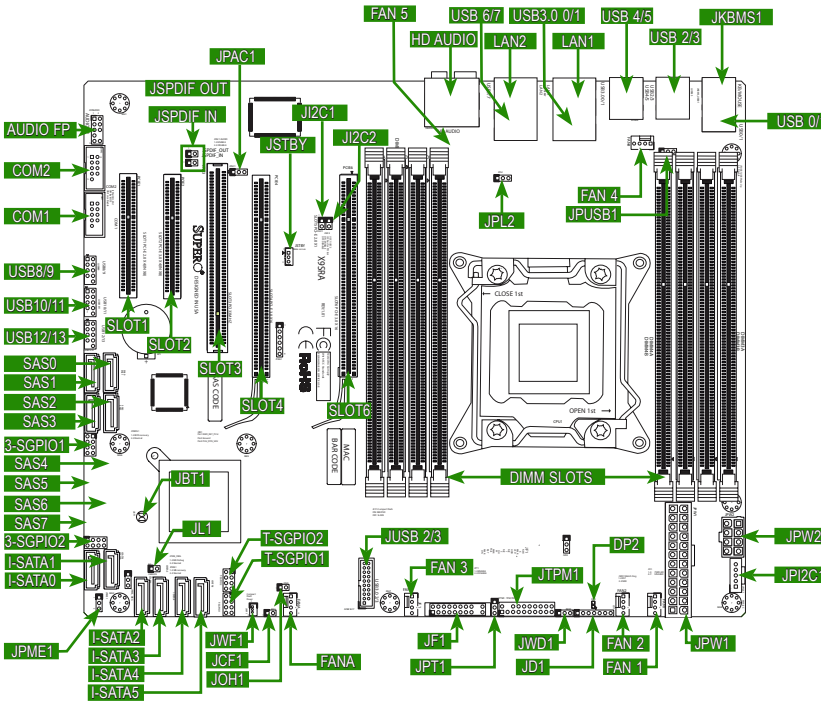
1. Begin by removing the PCI slot shield for the slot you wish to populate.

2. Fully seat the card into the card slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the motherboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-8 Motherboard Details

Figure 5-4. X9SRA Layout



Note: Not all SAS components and jumpers are included on the X9SRA.

Motherboard Headers/Connectors	
Connector	**Description**
AUDIO FP	Front Panel Audio Header
COM1, COM2	COM1 & COM2 Serial Port Headers
USB 8/9, USB 10/11, USB 12/13	USB 2.0 Headers for front panel access
JUSB2/3 (USB 3.0)	USB 3.0 Header for USB 2/3
USB 0/1, USB 2/3, USB 4/5, USB 6/7	Back Panel USB 2.0 Ports
USB 3.0 0/1	Back Panel USB 3.0 Ports
JKBMS1	Combination PS/2 Keyboard/Mouse Port
LAN1, LAN2	Gb Ethernet LAN Ports (LAN1 & LAN2)
HD Audio	High Definition (HD) Audio output jacks
JSPDIF OUT/IN	SP/DIF Audion In/Out Headers
SAS4~SAS7	X9SRA-3 only: SATA 2.0 (3Gb/sec) / SAS 2.0 (3Gb/sec) X9SRA only: Not supported
3-SGPIO1, 3-SGPIO2	Serial General Purpose I/O Headers for SAS
I-SATA0, I-SATA1	Serial ATA ports (SATA 3.0), 6Gb/s
I-SATA2~5	Serial ATA ports (SATA 2.0), 3Gb/s
JWF1	SATA DOM (Disk On Module) Power Connector
JOH1	Overheat LED/Fan Fail
FAN A, FAN1~FAN4	Internal Fan Headers
JF1	Front Panel Control Header
JTPM1	Trusted Platform Module (TPM) Header
JD1	Power LED / Speaker Header (Pins 4~7: External Speaker)
T-SGPIO1, T-SGPIO2	Serial Link General Purpose I/O Headers (5V Gen1/Gen 2)
JPW1	24-pin Main ATX Power Connector
JPW2	8-pin Secondary Power Connector
JPI2C1	Power Supply SMBus I2C Header
JL1	Chassis Intrusion Header
JSTBY	Legacy Wake On LAN Header
SLOT1	PCI-E 2.0 x4 (in x8 Slot)
SLOT2	PCI-E 3.0 x4 (in x8 Slot)
SLOT3,	PCI 33MHz Slot
SLOT4, SLOT6	PCI-E 3.0 x16 Slots

5-9 Connector Definitions

ATX Main PWR (JPW1) and CPU PWR Connectors (JPW2)

The 24-pin main power connector (JPW1) is used to provide power to the motherboard. The 8-pin CPU PWR connector (JPW2) is also required for the processor. These power connectors meet the SSI EPS 12V specification. See the table on the right for pin definitions.

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Caution: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these to the 24-pin and the two 8-pin power connectors on your motherboard to supply adequate power to your system. Failure to do so will void the manufacturer warranty on the power supply and motherboard.

Processor Power Connectors

JPWR1 and JPWR2 must also be connected to the power supply to provide power for the processors. See the table on the right for pin definitions.

Processor Power Connectors Pin Definitions (JPW1/JPW2)

Pins	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located next to the VGA port on the I/O Backpanel. These ports provide connectivity with speeds up to 1Gb/s. Please see the table on the left for the pin definitions.

LAN Ports Pin Definition

Pin#	Definition		
1	TD0-	10	SGND
2	TD0+	11	P3V3SB
3	TD1-	12	Act LED
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD2-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD3-	16	Ground
8	TD3+	17	Ground
9	P2V5SB	88	Ground

(NC: No Connection)

(Back_Panel) High Definition Audio (HD Audio)

This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output through the front panel stereo out for front, rear, center and subwoofer speakers. Use the Advanced software included in the CD-ROM with your motherboard to enable this function.

(BP) HD Audio	
Conn#	Signal
1	S/P DIF Out
2	Surround Out
3	CEN/LFE Out
4	Mic In
5	Line Out
6	Line In

Universal Serial Bus (USB)

Eight (8) Universal Serial Bus 2.0 ports are located on the I/O back panel, in addition to two USB 3.0 Ports that are located below LAN1. There are also six (6) USB 2.0 ports on three headers, and two (2) USB 3.0 ports on one header that can be used to provide front chassis access using USB cables (not included). See the tables below for pin definitions.

Front Panel USB (2.0) Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Back Panel USB (2.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Back Panel USB (3.0) Pin Definitions			
Pin#	Pin#	Signal Name	Description
1	10	VBUS	Power
2	11	D-	USB 2.0 Differential Pair
3	12	D+	
4	13	Ground	Ground of PWR Return
5	14	StdA_SSRX-	SuperSpeed Receiver
6	15	StdA_SSRX+	Differential Pair
7	16	GND_DRAIN	Ground for Signal Return
8	17	StdA_SSTX-	SuperSpeed Transmitter
9	18	StdA_SSTX+	Differential Pair

1. Back Panel USB 2.0 (USB #0)
2. Back Panel USB 2.0 (USB #1)
3. Back Panel USB 2.0 (USB #2)
4. Back Panel USB 2.0 (USB #3)
5. Back Panel USB 2.0 (USB #4)
6. Back Panel USB 2.0 (USB #5)
7. Back Panel USB 3.0 (USB 3.0 #0)
8. Back Panel USB 3.0 (USB 3.0 #1)
9. Back Panel USB 2.0 (USB #6)
10. Back Panel USB 2.0 (USB #7)
11. Front Panel USB 2.0 (USB #8/9)
12. Front Panel USB 2.0 (USB #10/11)
13. Front Panel USB 2.0 (USB #12/13)
14. Front Panel USB 3.0 (USB 3.0 #2/3)

Power Button

The connection for the power button is on pins 1 and 2 of JF1. The chassis power button should be connected here. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset header is located on pins 3 and 4 of JF1. Attach the reset switch on the computer chassis to these pins. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Overheat/Fan Fail LED (JOH1)

The JOH1 header is used to connect an LED to provide warnings of chassis overheat. This LED will also blink to indicate a fan failure. Refer to the table on right for pin definitions.

OH/Fan Fail LED Pin Definitions	
State	Message
Solid	Overheat
Blinking	Fan Fail

Overheat LED Pin Definitions	
Pin#	Definition
1	5vDC
2	OH Active

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is on Pins 9 and 10. NIC1 LED and NIC2 LED are 2-pin NIC LED headers. Attach NIC LED cables to NIC1 and NIC2 LED indicators to display network activities. Refer to the table on the right for pin definitions.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	LED VCC
10/12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate the status of HDD-related activities, including IDE, SATA activities. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	LED VCC
14	HD Active

Power LED

The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	LED VCC
16	Ground

Chassis Intrusion (JL1)

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Fan Headers (FAN1~4, FANA)

The X9SRA motherboard series has five fan headers (Fan 1~Fan 4 and Fan A). These fans are 4-pin fan headers. Pins 1-3 of these fan headers are backward compatible with the traditional 3-pin fans. However, the fan speed control setting in the BIOS Hardware Monitoring section will only work with 4-pin fans. This allows the BIOS to automatically set fan speeds based on the system temperature. Refer to the table on the right for pin definitions and fan usage. We recommend that 4-pin fans are used on the motherboard.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM_Control

Fan Usage	
FAN#	Use for
1~4	System/CPU
A	I/O Cards

Speaker (JD1)

On the JD1 header, Pins 3~4 are used for the internal speaker. Close Pins 3~4 with a jumper or cap to use the onboard speaker. If you wish to use an external speaker, attach the external speaker's cable to Pins 1~4. See the table on the right for pin definitions.

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 3~4	Internal Speaker
Pins1~4	External Speaker

Legacy Wake-On-LAN Header (JSTBY)

The onboard LANs (LAN1 and LAN2) do not need WOL header to support its Wake-On-LAN function. We preserved the legacy WOL header to provide convenience for some embedded customers who need internal power source from the board. See the table on the right for pin definitions.

Wake-On-LAN Pin Definitions

Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

A. Internal Buzzer

B. Wake On LAN

Power Supply I²C (JPI²C)

The Power Supply I²C Connector, located at JPI²C, monitors the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

PWR Supply I²C Pin Definitions

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	3.3V

PCI Slot SMB Enable (JI²C1/JI²C2)

Use Jumpers I²C1/I²C2 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings.

PCI Slot SMB Enable Jumper Settings

Jumper Setting	Definition
Short (Default)	Enabled
Open	Disabled

TPM Header (JTPM1)

This header is used to connect a Trusted Platform Module (TPM), which is available from a third-party vendor. A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the table on the right for pin definitions.

Trusted Platform Module Header Pin Definitions

Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME	4	No Pin
5	LRESET	6	VCC5
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	RSV0	14	RSV1
15	SB3V	16	SERIRQ
17	GND	18	CLKRUN
19	LPCPD	20	RSV2

Overheat/Fan Fail LED (JOH1)

The JOH1 header is used to connect an LED to provide warnings of chassis overheat. This LED will also blink to indicate a fan failure. Refer to the table on right for pin definitions.

Overheat LED Pin Definitions

Pin#	Definition
1	5vDC
2	OH Active

OH/Fan Fail LED Pin Definitions

State	Message
Solid	Overheat
Blinking	Fan Fail

A. Overheat/Fan Fail LED

T-SGPIO 1/2 & 3-SGPIO 1/2 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers are located next to the I-SATA Ports on the motherboard. Additionally, two 3-SGPIO ports (for SAS) are also located next to USB 8/9 . These headers are used to communicate with the enclosure management chip in the system. See the table on the right for pin definitions. Refer to the board layout below for the locations of the headers.

Serial_Link-SGPIO Pin Definitions

Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

DOM PWR Connector (JWF1)

The Disk-On-Module (DOM) power connector, located at JWF1, provides 5V (Gen1/Gen) power to a solid-state DOM storage device connected to one of the SATA ports. See the table on the right for pin definitions.

DOM PWR Pin Definitions

Pin#	Definition
1	5V
2	Ground
3	Ground

Serial Ports

Two COM headers (COM1 & COM2) are provided on the motherboard. The COM1 and COM2 headers are located next to the expansion slots to provide onboard serial connection support. See the table on the right for pin definitions.

Serial Ports-COM1/COM2 Pin Definitions

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

Front Accessible Audio Header

A 10-pin Audio header is located on the motherboard at AUDIO FP. This header allows you to connect the chassis' front panel audio ports to the motherboard. See the table on the right for pin definitions

A. COM1

B. COM2

C. Audio Header

10-in Audio Pin Definitions

Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

SPDIF IN / SPDIF OUT (JSPDIF_IN/ JSPDIF_OUT)

The SPDIF In (JSPDIF_In) and SPDIF Out (JSPDIF_Out) are used for input and output of S/P DIF digital audio. You will also need the appropriate cables to use these features.

SPDIF_Out Pin Definitions

Pin#	Definition
1	S/PDIF_Out
2	Ground

SPDIF_In Pin Definitions

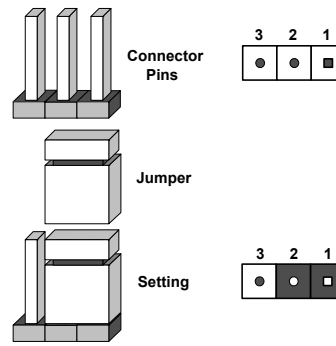
Pin#	Definition
1	S/PDIF_In
2	Ground

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



Clear CMOS (JBT1)

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing CMOS.

Note: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then short JBT1 to clear CMOS.

PCI Slot SMB Enable (JI²C1/JI²C2)

Use Jumpers I²C1/I²C2 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings.

PCI Slot SMB Enable Jumper Settings	
Jumper Setting	Definition
Short (Default)	Enabled
Open	Disabled

A. Clear CMOS
B. JI²C1
C. JI²C2

LAN Port Enable/Disable (JPL2)

Jumper JPL2 enables or disables LAN Port 2 on the motherboard. See the table on the right for jumper settings. The default setting is pins 1-2 (Enabled).

GLAN Enable Jumper Settings

Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

Watch Dog Reset (JWD1)

Watch Dog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

Watch Dog Jumper Settings

Jumper Setting	Definition
Pins 1-2	Reset (default)
Pins 2-3	NMI
Open	Disabled

TPM Support Enable (JPT1)

JPT1 allows the user to enable TPM (Trusted Platform Module) support to improve data integrity and system security. See the table on the right for jumper settings. The default setting is **Enabled**.

TPM Support Enable Jumper Settings

Jumper Setting	Definition
1-2 (Default)	Enabled
2-3	Disabled

CF Card Master/Slave (JCF1)

A Compact Flash Card Master/Slave Select Jumper is located at JCF1. Close this jumper to enable Compact Flash Card. For the Compact Flash Card or the Compact Flash Jumper (JCF1) to work properly, you will need to connect the Compact Flash-Card power cable to JWF1 first. Refer tothe board layout below for the location.

CF Slave/Master Jumper Settings

Jumper Setting	Definition
Open	Slave
Closed	Master

A. TPM Support Enable
B. CF Card Master/Slave Select

ME Recovery (JPME1)

ME Recovery (JPME1) is used to enable or disable the ME Recovery feature of the motherboard. Install the jumper on pins 1-2 for normal operation. Install pins 2-3 to reset Intel ME values back to their default settings. The default setting is pins 1-2 (Normal).

ME Recovery Jumper Settings

Jumper Setting	Definition
1-2 (Default)	Normal
2-3	Recover

Audio Enable (JPAC1)

JPAC enables or disables the onboard audio connections. See the table on the right for jumper settings. The default setting is Enabled.

Audio Enable (JPAC1)

Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

A. ME Recovery

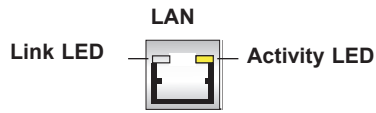
B. Audio Enable

5-11 Onboard Indicators

LAN Port LEDs

The LAN ports are located on the I/O back-panel of the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the Link LED may be green, amber, or off to indicate the speed of the connections. See the tables at right for more information.

LAN Link LEDs (Green/Amber/Off)	
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps



Onboard Power LED (DP2)

An Onboard Power LED is located at DP2 on the motherboard. When DP2 is on, it means that the AC power cable is connected, the power supply switch and soft switch are on, and the system is running.

Onboard PWR LED (DP2) LED Status	
Status	Definition
Off	System Off (Soft Switch)
On	System is Running

A. Onboard Power LED

5-12 SATA Ports

SATA Ports

There are four (4) SATA 2.0 ports, two (2) SATA 3.0 ports and an additional four (4) SATA 2.0 ports located on SAS 0~3:

I-SATA 0~1 : SATA 3.0 (6Gb/sec)

I-SATA 2~5 : SATA 2.0 (3Gb/sec)

SAS 0~3 : SATA 2.0 (3Gb/sec)

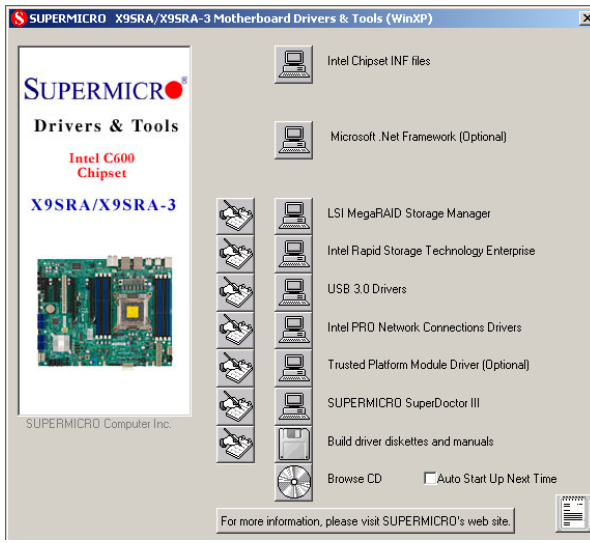
SATA/SAS Ports Pin Definitions	
Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

A. I-SATA 0 (3.0)
B. I-SATA 1 (3.0)
C. I-SATA 2 (2.0)
D. I-SATA 3 (2.0)
E. I-SATA 4 (2.0)
F. I-SATA 5 (2.0)

1. SAS 0
2. SAS 1
3. SAS 2
4. SAS 3

5-13 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your motherboard.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

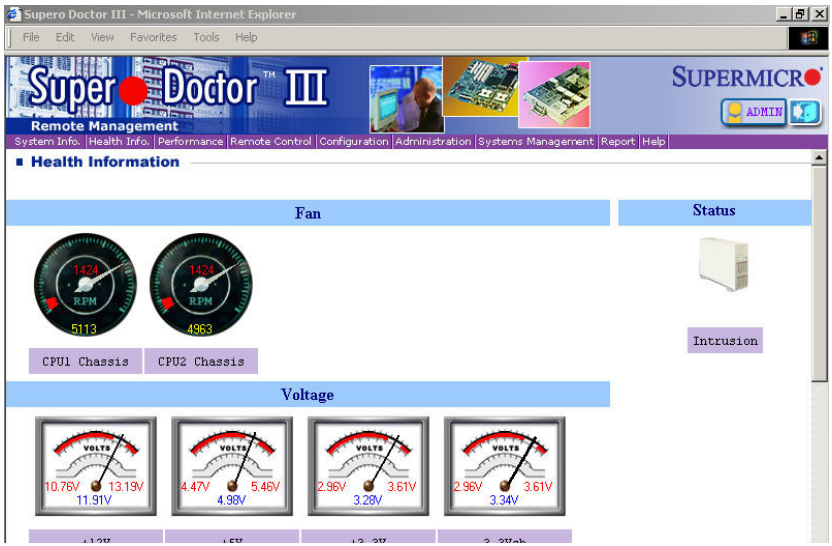
SuperDoctor III

The SuperDoctor® III program is a Web based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, as the SuperDoctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor.

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)

Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity

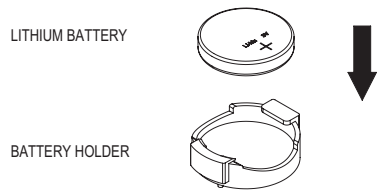
Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro Web site at http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm.

For Linux, we recommend using SuperDoctor II.

5-14 Motherboard Battery

Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 5-5). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032). Dispose of used batteries according to the manufacturer's instructions.

Figure 5-5. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform simple maintenance on the SC732D4-903B chassis. Following the component installation steps in the order given will eliminate most common problems. If some steps are unnecessary, skip ahead to the step that follows. The only tool you will need is a Philips screwdriver.

6-1 Static-Sensitive Devices

Static electrical discharge can damage electronic components. To prevent damage to any printed circuit boards (PCBs), handle them very carefully. The following measures are generally sufficient to protect your equipment from static discharge.

Cautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Additional warnings and cautions see http://www.supermicro.com/about/policies/safety_information.cfm.

Unpacking

The motherboard is shipped in antistatic packaging. When unpacking the board, make sure the person handling it is static protected.

Installation Instructions

6-2 Removing the Power Cord

Before performing any setup or maintenance on the chassis, use the following procedure to ensure that power has been removed disconnected from the system.

Removing the Power Cord

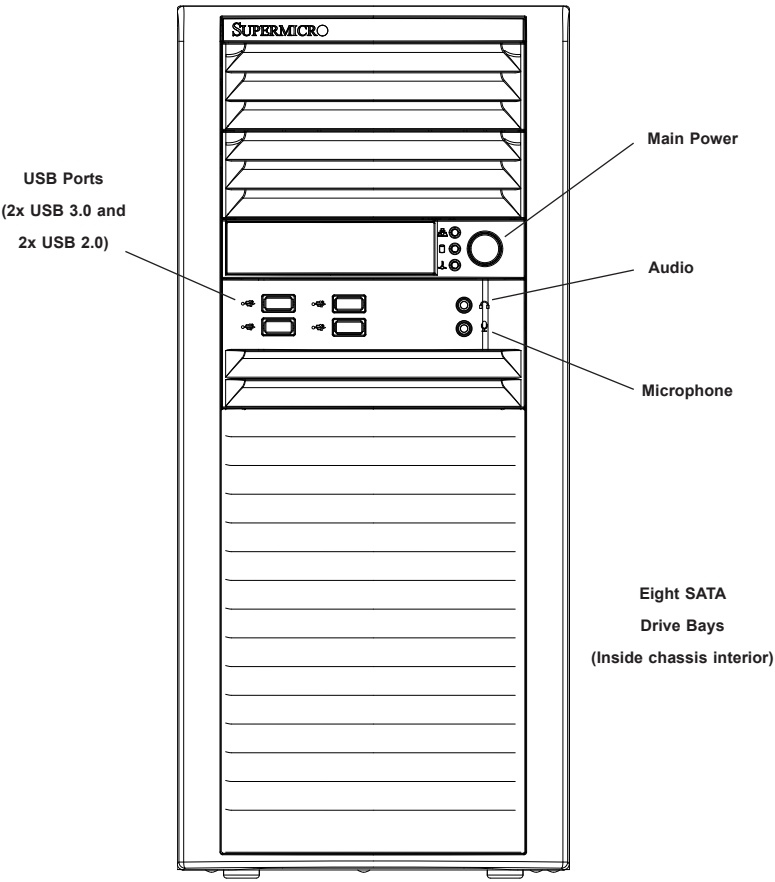
1. Use the operating system to Power down the system, following the on-screen prompts.

2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply.

3. If your system has dual redundant power supplies, remove the cords from both power supplies.

4. Disconnect the cord from the power strip or wall outlet.

Figure 6-1. Chassis Front View



6-3 Front Control Panel

The front control panel must be connected to the JF1 connector on the motherboard to provide you with system status and alarm indications. A ribbon cable has bundled these wires together to simplify this connection.

Connect the cable from JF1 on the motherboard (making sure the red wire plugs into pin 1) to the appropriate comnnector on the front control panel PCB (printed circuit board). Pull all excess cabling over to the control panel side of the chassis. The LEDs on the control panel inform you of system status - see Figure 6-2 for details. See Chapter 5 for details on JF1.

Figure 6-2. Front Control Panel LEDs

HDD

Indicates IDE device and hard drive activity. On the SC743TQ-1200B-SQ, this LED indicates hard drive activity when flashing.

NIC

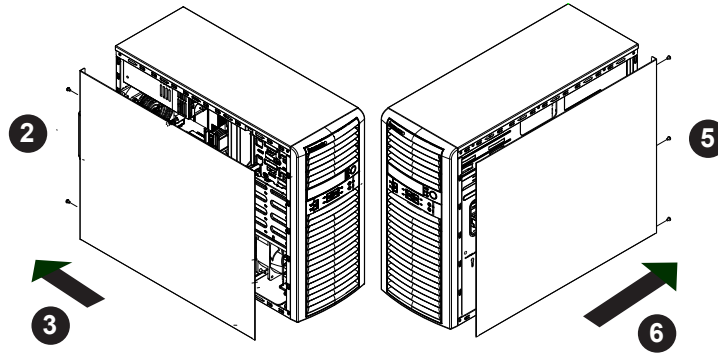
Indicates network activity on the LAN port.

Overheat/Fan Fail

When this LED flashes, it indicates a fan failure. When on continuously it indicates an overheat condition (see Chapter 3 for details).

6-4 Removing the Chassis Side Covers

Figure 6-3: Removing the Chassis Side Covers



The SC732D4-900B features two removable side covers, allowing easy access to the chassis interior.

Removing the Side Covers

1. Disconnect the chassis from any power souce.
2. Remove the two screws securing the left side cover to the chassis.
3. Slide the left cover toward the rear of the chassis.
4. Lift the left cover from the chassis.
5. Remove the three screws securing the right side cover to the chassis.
6. Slide the right cover toward the rear of the chassis
7. Lift the right cover from the chassis.

Caution: Except for short periods of time, do NOT operate the system without the cover in place. The chassis cover must be in place to allow for proper airflow and to prevent overheating.

Additional warnings and cautions can be found on the Supermicro Web site at http://www.supermicro.com/about/policies/safety_information.cfm.

6-5 System Fans

One 12-cm chassis cooling fan provides air intake while another 12-cm exhaust fan expels hot air from the chassis. Both are low-noise fans that result in "Whisper-Quiet" operation (~28 dB). The fans should be connected to headers on the motherboard (see Chapter 5).

The power supply includes redundant cooling fans. If one fan fails, the remaining fan will ramp up its rpm to provide sufficient cooling. The Power Fail LED will illuminate and an audible alarm will sound, which can be silenced with a button on the power supply. If a power supply fan fails, you should replace the power supply at your earliest convenience.

Fan Failure

Under normal operation, the chassis fans, the exhaust fan and the power supply fans run continuously. The chassis fans are hot-pluggable and can be replaced without powering down the system.

Replacing Chassis Cooling Fans

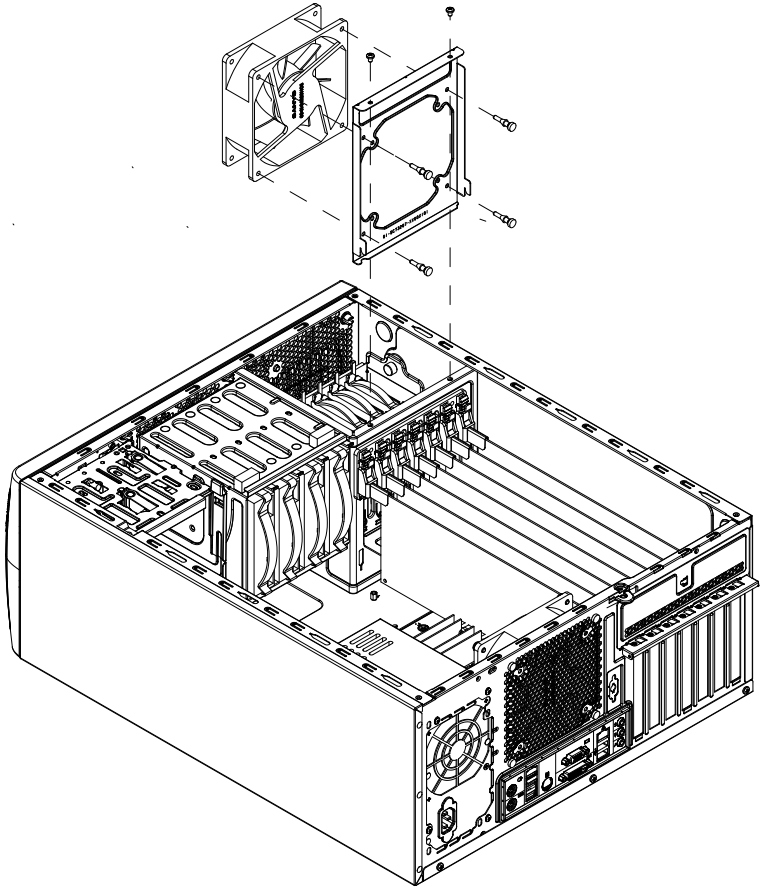
Removing a Fan

1. First locate the failed chassis fan by removing the top/left chassis cover (see Chapter 2 for details). Locate the fan that has stopped working.
2. Disconnect the power cord to the chassis and disconnect the cable to the fan.
3. Remove the two screws securing the fan bracket to the chassis.
4. Remove the four screws securing the fan to the fan bracket.
5. Lift the fan up and out of the chassis.

Installing a New Fan

1. Replace the failed fan with an identical one (available from Supermicro)
2. Secur the fan to the bracket with four screws and secure the bracket to the chassis with two screws.
3. Install it in the same position and orientation as the one you removed.
4. Check that the fan is working then replace the chassis cover.

Figure 6-4. Removing a Chassis Fan



6-6 Drive Installation

A total of eight SAS or SATA drives may be housed in the SC732D4-900B chassis. The drive IDs are preconfigured as 0 through 7 in order from bottom to top. Remove the side panel of the chassis to access these drives as described in Chapter

Caution: Regardless of how many SATA drives are installed, all drive carriers must remain in the drive bays to promote proper airflow.

Rotating the Hard Drive Cage

1. Disconnect the chassis from any power source.
2. Lift the release tab (A).
3. Rotate the hard hard drive cage (B) outward.

Figure 6-5. Removing a SATA Drive Carrier

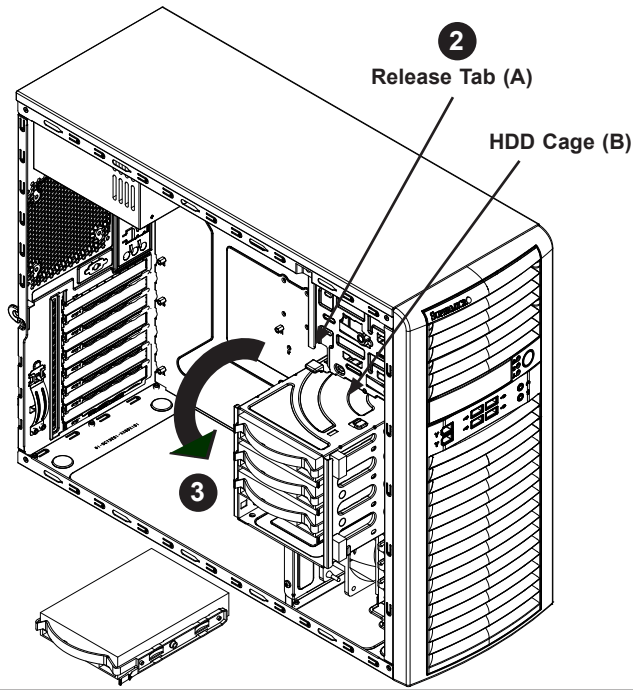
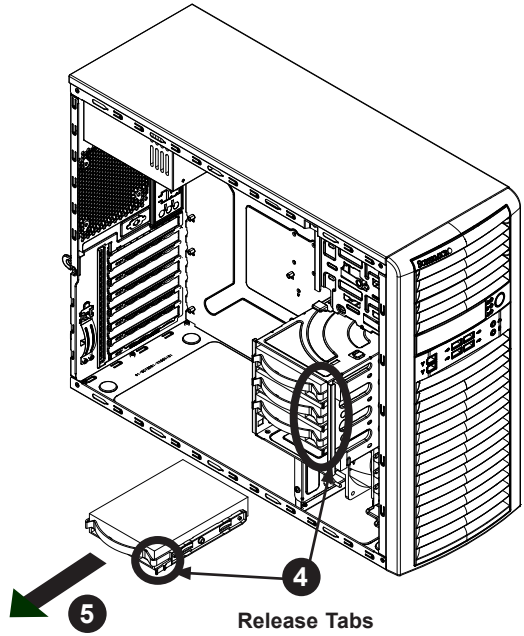


Figure 6-6: Removing the Hard Drive Carrier from the Hard Drive Cage



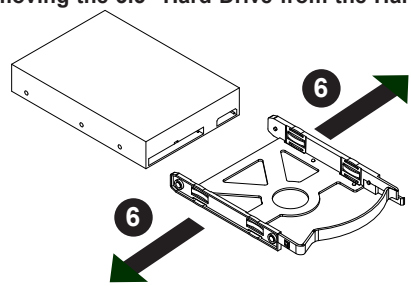
4. Press the release tab on the side of the hard drive carrier which is to be removed from the hard drive cage.

5. Gently pull the hard drive carrier out of the cage.

6. If a hard drive is already present, remove it by carefully pulling the sides of the hard drive carrier outward.

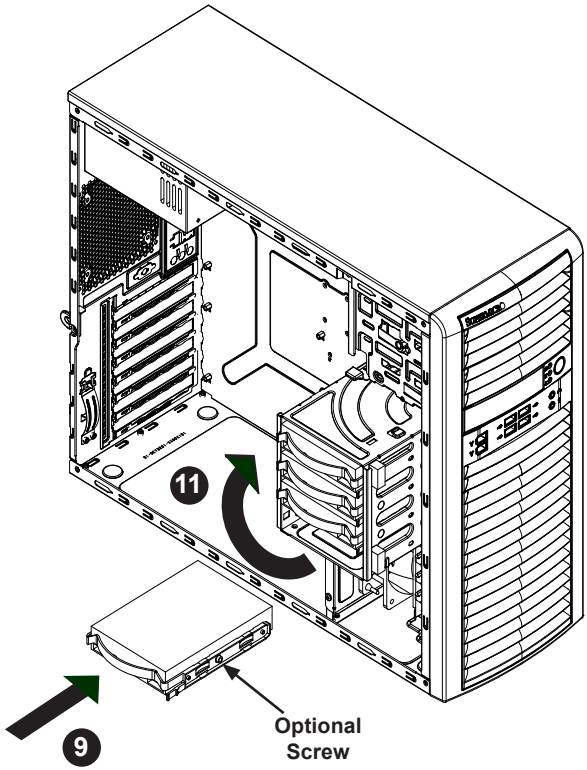
7. Remove the hard drive from the hard drive carrier.

Figure 6-7 Removing the 3.5" Hard Drive from the Hard Drive Carrier



Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/storage.cfm

Figure 6-8: Installing the Hard Drive Carrier into the Hard Drive Cage



8. Insert the new hard drive into the hard drive carrier.

9. Insert the hard drive carrier into the hard drive cage, sliding it towards the back of the the hard drive cage until it clicks into a locked position.

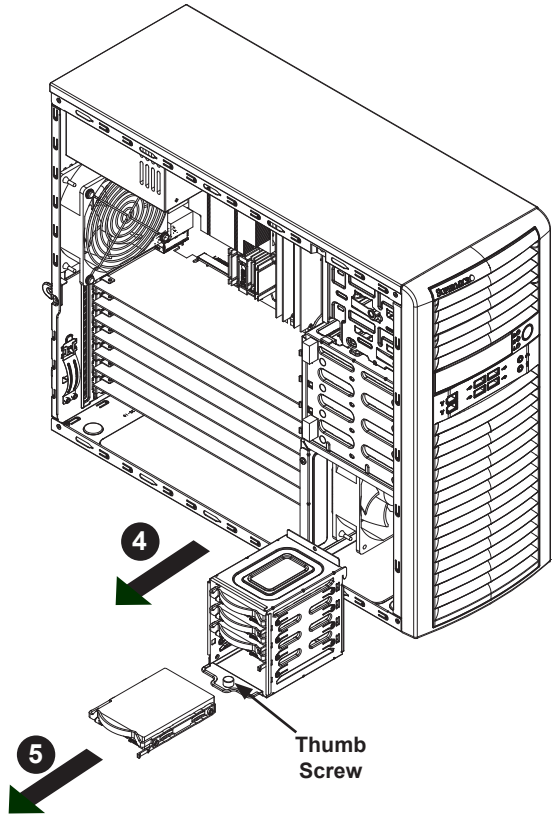
10. If desired, each hard drive carrier may be secured to the exterior of the hard drive cage using one optional screw.

11. Rotate the hard drive cage 90 degrees inward, returning it to the closed, operational position in the chassis.

12. Connect the related cables to the hard drives.

6-7 Removing and Installing Optional 2.5" Hard Drives

Figure 6-9: Removing the 2.5" Hard Drives

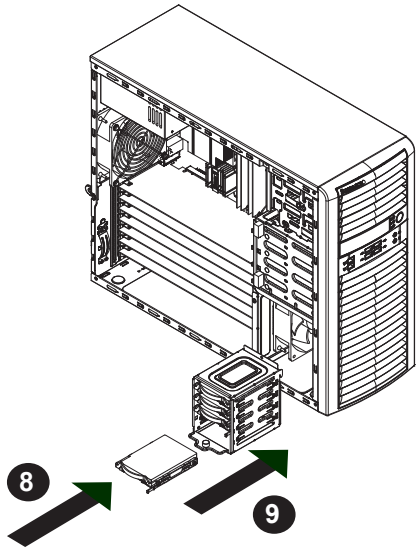


The SC732D4-900B chassis must be powered-down before hard drives can be removed from the hard drive carriers.

Removing and Installing 2.5" Hard Drives

1. Disconnect the chassis from any power source.
2. Loosen the thumb screw securing the 2.5" hard drive cage to the chassis.
3. Disconnect all cables from the hard drive.
4. Slide the 2.5" hard drive cage out of the chassis.

Figure 6-10: Installing 2.5" Hard Drives



5. If a hard drive is already present, remove it by carefully pulling the sides of the hard drive carrier outward.
6. Remove the hard drive from the hard drive carrier.
7. Insert the new hard drive into the hard drive carrier.
8. Insert the hard drive carrier into the hard drive cage, sliding it towards the back of the the hard drive cage until it clicks into a locked position.
9. Slide the 2.5" hard drive cage back into the chassis and tighten the thumb screw to secure the cage.
10. Connect the related cables to the hard drive

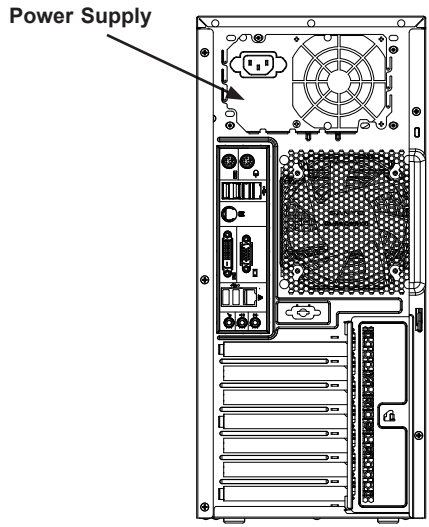
Warning: Only enterprise level HDDs are recommended for use in this chassis.

Additional warnings and cautions can be found on the Supermicro Web site at http://www.supermicro.com/about/policies/safety_information.cfm.

6-8 Power Supply

The SC732D4-900B chassis includes a 900 Watt power supply. In the unlikely event that it becomes necessary to replace the power supply, follow the instructions below.

Figure 6-11: Removing the Power Supply



Changing the Power Supply

1. Disconnect the chassis from any power source.
2. Disconnect the motherboard cables.
3. Remove the screws securing the power supply to the chassis, which are located on the rear of the chassis. Set these screws aside for later use.
4. Gently lift the power supply out of the chassis.
5. Replace the failed power supply with an identical power supply model.
6. Secure the new power supply using the screws previously set aside.
7. Plug the AC power cord back into the module and power-up the system.

Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X9SRA motherboard series. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Note: For instructions on BIOS recovery, please refer to the instruction guide posted at http://www.supermicro.com/support/manuals/.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

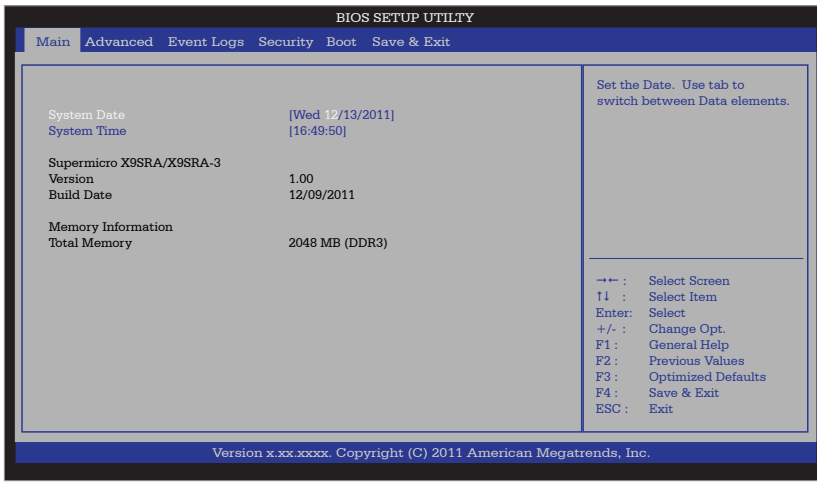
How to Start the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

Caution: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

Supermicro X9SRA/X9SRA-3

Version

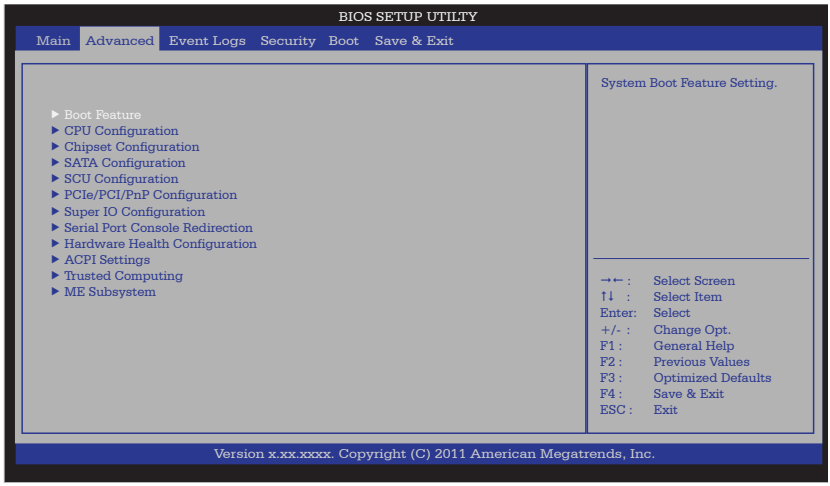
Build Date

Memory Information

Total Memory

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:



▶BOOT Feature

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt

19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4-Seconds Override to force the user to press and hold the Power Button for 4 seconds before the system turns off. Select Instant Off if you want the system to instanty power off when the Power Button is pressed. The options are 4 Seconds Override and **Instant Off.**

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Stay-Off and **Last State**.

▶CPU Configuration

Caution: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or incorrect DRAM timing may cause system to become unstable. When this occurs, revert to the default setting.

▶Socket 1 CPU Information

This item is for informational purposes only and displays CPU information including type, speed, number of cores, etc.

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. Select Disabled to enhance system stability. The options are **Disabled** and Enabled.

Hyper Threading

Set to Enabled to use the processor's Hyper Threading Technology feature. The options are **Enabled** and Disabled.

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1, 2, 3, 4, 5, 6 and 7.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS.).

Execute-Disable Bit (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Intel® AES-NI

Set to Enabled to use the processor's Advanced Encryption Standard (AES) feature. The options are **Enabled** and Disabled.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

DCU Streamer Prefetcher

This feature enables prefetch of the next L1 data line based on multiple loads in the same cache line. The options are **Enabled** and Disabled.

DCU IP Prefetcher

Set this feature to Enabled to activate the L1 Data Prefetcher based on sequential load history. The options are **Enabled** and Disabled.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions,

creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.

Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

▶CPU Power Management Configuration

Power Technology

This feature determines what power-saving scheme the motherboard uses. The options are Disabled, **Energy Efficient** and Custom. If Custom is selected, the following options become available:

EIST

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disabled and **Enabled**.

Turbo Mode

This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled.**

C1E Support

Select Enabled to use the "Enhanced Halt State" feature. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

CPU C3 Report, CPU C6, CPU C7 Report

This BIOS feature enables or disables C3 (ACPI C2), C6 (ACPI C3). C7 (ACPI C3) reporting to the operating system. The options are **Disabled** and Enabled.

Package C State Limit

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are C0, C1, **C6**, and No Limit.

Long duration power limit - this is the processor power consumption limit (in Watts) during a long duration time window.

Long duration maintained - this is the time in milliseconds where the Long Duration Power Limit is maintained.

Short duration power limit - During Turbo Mode, the system may exceed the processor's default power setting and exceed the Short Duration Power limit. By increasing this value, the processor can provide better performance for a short duration.

▶Chipset Configuration

WARNING: Setting the wrong values in the following sections may cause the system to malfunction.

▶North Bridge Configuration

▶Integrated IO Configuration

Intel® VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are **Enabled** and Disabled.

Intel® I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for more other tasks. The options are Disabled and **Enabled**.

DCA Support

This feature accelerates the performance of I/O devices using Direct Cache Access. The options are **Enabled** and Disabled.

IIO 1 PCIe Port Bifurcation Control

Slot 2 PCI-E 3.0 x4 Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1, GEN2 and **GEN3**.

Slot 6 PCI-E 3.0 x16 Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1, GEN2 and **GEN3**.

Slot 4 PCI-E 3.0 x16 Link Speed

This feature enables the user to select the target link speed for this slot. The options are GEN1, GEN2 and **GEN3**.

▶DIMM Configuration

Memory Configuration

This section displays memory status such as Current Memory Mode, Memory Speed, Mirroring and Sparing information.

▶DIMM Information

This feature displays information regarding the installed memory.

Memory Mode

The options are **Independent**, Mirroring, Lockstep and Sparing.

Independent - All DIMMs are available to the operating system.

Mirroring - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

DRAM RAPL Mode

RAPL which stands for Running Average Power Limit is a feature that provides mechanisms to enforce power consumption limits on supported processors The options are DRAM RAPL MODE0 , **DRAM RAPL MODE1**, and Disabled.

DDR Speed

Use this option to force the system memory to run at a different frequency than the default frequency. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333, Force DDR3-1600 and Force SPD.

Channel Interleaving

This feature selects from the different channel memory interleaving methods. The options are **Auto,** 1 Way, 2 Way, 3 Way and 4 Way.

Rank Interleaving

This feature selects from the different rank memory interleaving methods. The options are **Auto,** 1 Way, 2 Way, 3 Way, 4 Way and 8 Way.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the North Bridge will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the North Bridge will be scrubbed every day. The options are **Enabled** and Disabled.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and **Disabled**.

Data Scrambling

This feature enables Data Scrambling. The options are **Enabled** and Disabled.

Device Tagging

This feature enables Device Tagging. The options are Enabled and **Disabled**.

Thermal Throttling

This feature selects from the different throttling methods. The options are Disabled and **CLTT**.

CLTT - Closed Loop Thermal Throttling.

▶South Bridge Configuration

This item displays the current South Bridge Revision.

All USB Devices

This feature enables all USB ports/devices. The options are **Enabled** and Disabled.

EHCI Controller 1 / EHCI Controller 2

This feature enables the Enhanced Host Controller Interface (EHCI). The options are **Enabled** and Disabled.

Legacy USB Support

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFI applicatioins. The options are **Enabled,** Disabled and Auto.

Port 60/64 Emulation

This feature enables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB aware Operating Systems. The options are **Enabled,** and Disabled

EHCI Hand-Off

This item is for Operating Systems that does not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The settings are Enabled and **Disabled**.

GbE Controller

Select Enabled to activate the onboard gigabit Ethernet controller. The settings are **Enabled** and Disabled.

Wake on LAN from S5

Select Enabled to activate the capabiltiy to 'wake-up' the system from the S5 power state (Soft Off State) through the Ethernet controller. The settings are **Enabled** and Disabled.

Deep Sx (EUP)

Select Enabled to enable Deep Sleep State support. The settings are Enabled and **Disabled.**

Azalia HD Audio

This feature disables the Azalia High Definition Audio support. The options are **Enabled** and Disabled.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA Devices and displays the following items:

SATA Port0~Port5

This item displays the information detected on the installed SATA drives on the particular SATA port.

SATA Mode

This item selects the mode for the installed drives. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial-ATA Controller 0~1

This feature is used to activate/deactivate the SATA controller, and sets the compatibility mode. The options are Disabled, Enhanced and **Compatible.** The default of Serial-ATA Controller 1 is **Enhanced**.

AHCI Mode

The following items are displayed when AHCI Mode is selected:

Aggressive Link Power Management

This feature Enables or Disables Agressive Link Power Management support for Cougar Point B0 stepping and later. The options are **Enabled** and Disabled.

Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

Staggered Spin Up

Set this item to Enabled to enable Staggered Spin-up support. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Set this item to Enabled to enable hot-plugging for the particular port. The options are **Enabled** and Disabled.

▶SCU Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SAS SCU Devices and displays the following items:

Disable Storage Controller Unit (SCU) Devices

Set this item to Enabled to activate the chipset's SCU devices. The options are **Enabled** and Disabled.

OnChip SCU Option PROM

Set this item to Enabled to activate the onboard SAS option ROM. The options are **Enabled** and Disabled.

▶PCIe/PCI/PnP Configuration

This feature allows the user to set the PCI/PnP configurations for the following items:

PCI ROM Priority

In case of multiple Option ROMs (Legacy and EFI-compatible), this feature specifies what ROM to launch. The options are **Legacy ROM** and EFI Compatible ROM.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32 PCI Bus Clocks, **64 PCI Bus Clocks**, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks and 248 PCI Bus Clocks.

Above 4G Decoding

Set this item to Enabled to activate 64-bit capable devices to be decoded above the 4G address space. This works only if the system supports 64-bit PCI decoding. The options are Enabled and **Disabled**.

PERR# Generation

Set this item to Enabled to allow PCI devices to generate PERR# error codes. The options are Enabled and **Disabled**.

SERR# Generation

Set this item to Enabled to allow PCI devices to generate SERR# error codes. The options are Enabled and **Disabled**.

Maximum Payload

This feature selects the setting for the PCIE maximum payload size. The options are **Auto,** 128 Bytes**,** and 256 Bytes**.**

Maximum Read Request

This feature selects the setting for the PCIE maximum Read Request size. The options are **Auto,** 128 Bytes**,** 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes**.**

ASPM Support

Set this item to the desired ASPM (Active State Power Management) level. The options are **Disabled,** Auto and Force L0s..

Slot 1 PCI-E 2.0 x4 OPROM,
Slot 2 PCI-E 3.0 x4 OPROM,
Slot 3 PCI 33MHz OPROM,
Slot 4 PCI-E 3.0 x16 OPROM,
Slot 5 PCI-E 2.0 x1 OPROM,
Slot 6 PCI-E 3.0 x16 OPROM

Use this feature to enable or disable PCI-E or PCI slot Option ROMs. The options are Disabled and **Enabled.**

Onboard LAN Option ROM Select

This feature selects whether to load the iSCSI or PXE onboard LAN option ROM. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM / Load Onboard LAN2 Option ROM

This feature is to enable or disable the onboard option ROMs. The options are Disabled and Enabled. The default for LAN 1 is **Enabled**. Default for LAN 2 is **Disabled**.

Load Onboard SAS Option ROM

This feature selects whether to load the SAS option ROM. The options **Enabled** and Disabled.

VGA Priority

This option allows the user to specify which graphics controller to be used as the primary boot device. The options are **Onboard** and Offboard.

▶Super IO Device Configuration

▶Serial Port 1 Configuration / Serial Port 2 Configuration

Serial Port 1 / Serial Port 2

Select Enabled to enable the onboard serial port. The options are **Enabled** and Disabled.

Serial Port 1 Settings / Serial Port 2 Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable.

The options for Serial Port 1 are:

Auto,

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

The options for Serial Port 2 are:

Auto,

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;

▶Serial Port Console Redirection

COM1, COM2 Console Redirection

Use this feature to enable console redirection for COM1, and COM2 ports. The options are Enabled and Disabled. The default for COM1 and COM2 is **Disabled**.

▶Console Redirection Settings

Configure the following options for the Console Redirection Settings. The most common settings are set as default:

Terminal Type : Select ANSI, **VT100**, VT100+, or VT-UTF8

Bits per Second (BPS): 9600, 19200, 38400, 57600, or **115200**

Data Bits: **8** or 7

Parity: **None**, Even, Odd, Mark, or Space

Stop Bits: **1** or 2

Flow Control: **None** or Hardware RTS/CTS

VT-UTF8 Combo Key Support: **Enabled** or Disabled

Recorder Mode: **Disabled** or Enabled

Resolution 100x31: Disabled or **Enabled**

Legacy OS Redirection Resolution: 80x24 or **80x25**

PuTTY Keypad: **VT100**, Linux, XTerm86, SCO, ESCN, VT400

Serial Port for Out-of-Band Management / Windows Emergency Management Services (EMS)

Use this feature to enable console redirection.

Console Redirection

Use this feature to enable console redirection for Serial Port Out-of-Band Management / Windows Emergency Management Services (EMS) ports. The options are **Enabled** and Disabled.

▶Console Redirection Settings

Configure the following options for the Console Redirection Settings. The most common settings are set as default:

Out-of-Band Mgmt Port: **COM1**, COM2

Terminal Type : Select ANSI, VT100, VT100+, or **VT-UTF8**

Bits per Second (BPS): 9600, 19200, 57600, or **115200**

Flow Control: **None,** Hardware RTS/CTS, Software Xon/Xoff

Data Bits: **8** or 7

Parity: **None**, Even, Odd, Mark, or Space

Stop Bits: **1** or 2

▶Hardware Health Configuration

Fan Speed Control Mode

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective

system cooling. Select "Full Speed" to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling. This setting is recommended for special system configuration or debugging. Select "Standard" for the onboard fans to run at 50% of the Initial PWM Cycle in order to balance the needs between system cooling and power saving. This setting is recommended for regular systems with normal hardware configurations. Select "Optimal" for the onboard fans to run at 30% of the Initial PWM Cycle for best power efficiency and maximum quietness. The options are Full Speed (@100% of PWM Cycle), **Standard** (@50% of PWM Cycle), and Optimal (@30% of PWM Cycle).

CPU Temperature Display Mode

This feature displays the CPU temperature detected by DTS (i.e., +34^{o}C) or temperature status in text ("Low", "Medium" or "High"). The options are **Text Mode** or DTS.

CPU Temperature

If Text Mode is selected, the CPU Temperature Display Mode will show the CPU temperature status as follows:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm:

The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature / Peripheral Temperature

This feature displays the system and peripheral device temperatures, as detected by the motherboard sensors.

Fan 1 ~ Fan 4, Fan A Speed

This feature displays the fan speed readings from fan interfaces Fan1 through Fan4 and FanA.

VCORE, 12V, VDIMM, 5VCC, CPU VTT, AVCC, 3.3VCC, VSB, VBAT

This feature displays the current voltages of the above voltage monitors.

▶ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Sleep State

This setting allows you to configure the ACPI (Advanced Configuration and Power Interface) sleep state for your system when it is in the Suspend mode. The options are Suspend Disabled, **S1 (CPU Stop Clock)**, and S3 (Suspend to RAM). S3 (Suspend to RAM) is the deepest sleep state in these options.

High Precision Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

▶Trusted Computing

TPM Support

Select Enable to activate BIOS support for trusted platforms (TPM 1.1/1.2) and allow the BIOS to automatically download the drivers needed to provide support for the platforms specified. The options are Disable and **Enable**.

TPM State

This feature changes the TPM State. The options are Disabled and **Enabled**. Note: The system will restart to change the TPM State.

Pending operation

Displays any TPM-related operation by the system.

Pending operation

The following are informational status messages that indicate the current TPM State:

TPM Enabled Status

TPM Active Status

TPM Owner Status

▶Intel® TXT (LT-SX) Configuration

Intel TXT Initialization

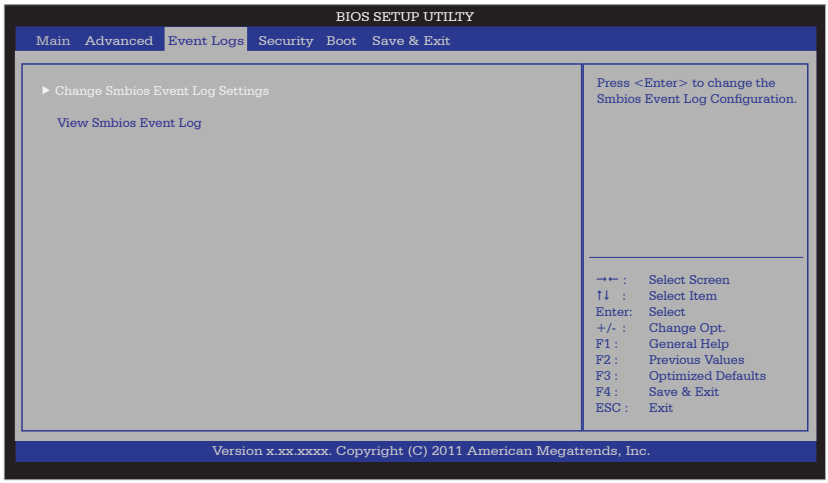
Intel TXT (Trusted Execution Technology) helps protect against software-based attacks and ensures protection, confidentiality and integrity of data stored or created on the system. The options are Enabled and **Disabled.**

This section also displays Intel TXT related information and dependencies needed to support this feature.

▶ME Subsystem

This item displays the ME Subsystem information.

7-4 Event Logs


BIOS SETUP UTILITY
Main Advanced Event Logs Security Boot Save & Exit
► Change Smbios Event Log Settings
View Smbios Event Log
Press <Enter> to change the Smbios Event Log Configuration.
→← : Select Screen
↑↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit
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▶Change SmBIOS Event Log Settings

Smbios Event Log

Change this item to enable or disable all features of the Smbios Event Logging during boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

Change this item to enable or disable runtime error logging. The options are **Enabled** and Disabled.

Memory Correction Error Threshold

Change this item to define the system's memory correction error threshold. Directly enter a numeric value, **default is 10**.

PCI Error Logging Support

Change this item to enable or disable runtime error logging. he options are Enabled and **Disabled**.

Erase Event Log

This option erases all logged events. The options are **No**, Yes, Next reset and Yes, Every reset.

When Log is Full

This option automatically clears the Event Log memory of all messages when it is full. The options are **Do Nothing** and Erase Immediately.

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are **Disabled** and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of occurences a duplicate event must happen before the MECI counter is incremented. This is a numeric value.

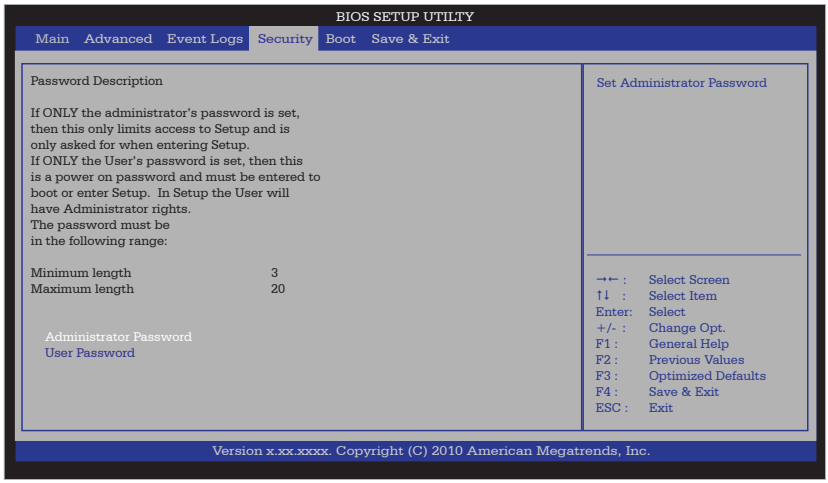
METW

The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99.

View SmBIOS Event Log

This feature displays the contents of the SmBIOS Event Log.

7-5 Security Settings


BIOS SETUP UTILTY
Main Advanced Event Logs Security Boot Save & Exit
Password Description
If ONLY the administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→← : Select Screen
↑↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit
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- If the Administrator password is defined ONLY - this controls access to the BIOS setup ONLY.
- If the User's password is defined ONLY - this password will need to be entered during each system startup or boot, and will also have Administrator rights in the setup.
- Passwords must be at least 3 chacters, and up to 20 characters in length.

Administrator Password

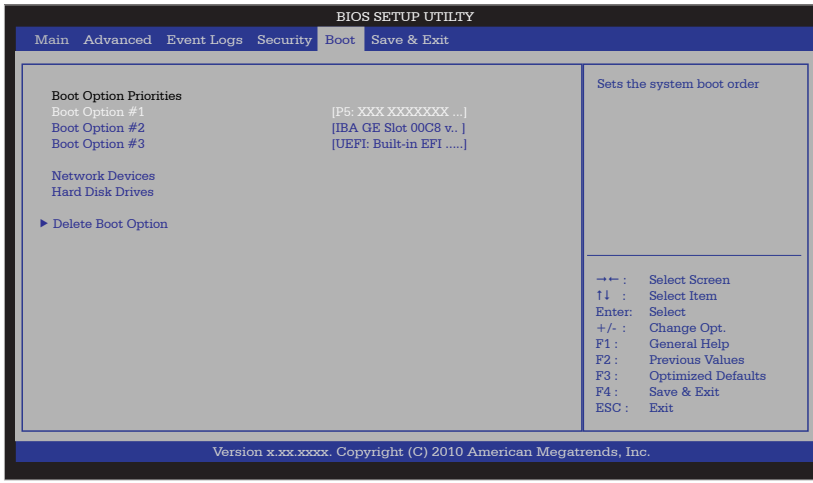
Press Enter to create a new, or change an existing Administrator password.

User Password:

Press Enter to create a new, or change an existing User password.

7-6 Boot

Use this feature to configure Boot Settings:


BIOS SETUP UTILTY
Main Advanced Event Logs Security Boot Save & Exit
Boot Option Priorities
Boot Option #1 [P5: XXX XXXXXXX ...]
Boot Option #2 [IBA GE Slot 00C8 v..]
Boot Option #3 [UEFI: Built-in EFI .....]
Network Devices
Hard Disk Drives
▶ Delete Boot Option
Sets the system boot order
→← : Select Screen
↑↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit
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Boot Options Priorities

This feature allows the user to specify which devices are boot devices and the order of priority from which the systems boots from during startup.

Boot Option #1, Boot option #2, Boot Option #3, etc

The settings are **Built-in EFI Shell**, [any detected boot device] and Disabled.

USB Device BBS Priorities

Network Devices, Hard Disk Drives

This option sets the order of the legacy network devices and Hard Disks detected by the motherboard.

Add New Boot Option

▶Delete Boot Option

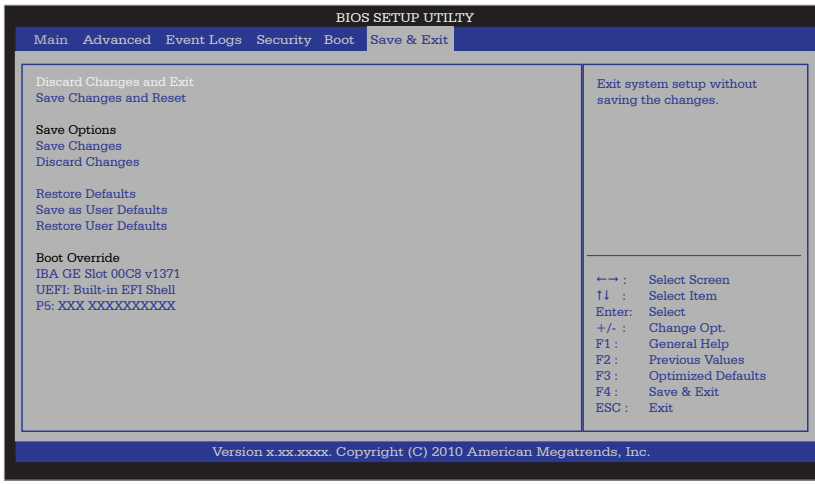
This feature allows the user to delete a previously defined boot device from which the systems boots from during startup.

Boot Option #1, Boot option #2, Boot Option #3, etc

The settings are **Built-in EFI Shell**, and [any pre defined boot device]

7-7 Save & Exit

Select the Exit tab from the BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Save Changes and Reset

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Save Changes

When you have completed the system configuration changes, select this option to save any changes made. This will not reset (reboot) the system.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Restore Optimized Defaults

To set this feature, select Restore Defaults from the Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use

Restore User Defaults

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

Boot Override

Listed on this section are other boot options for the system (i.e., Built-in EFI shell). Select an option and press <Enter>. Your system will boot to the selected boot option.

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue with bootup. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue to bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code/LED	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	Display memory read/write error	Video adapter missing or with faulty memory
OH LED On	System OH	System Overheat

Notes

Appendix B

UEFI BIOS Recovery Instructions

Caution: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) specification provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism for add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot up the system. UEFI offers a clean, hand-off control to a computer system at bootup.

How to Recover the UEFI BIOS Image (-the Main BIOS Block)

An AMIBIOS flash chip consists of a boot sector block and a main BIOS code block (a main BIOS image). The boot sector block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original BIOS image is corrupted. When the system power is on, the boot sector codes execute first. Once it is completed, the main BIOS code will continue with system initialization and bootup.

Note: Follow the BIOS Recovery instructions below for BIOS recovery when the main BIOS block crashes. However, when the BIOS Boot sector crashes, you will need to send the motherboard back to Supermicro for RMA repair.

To Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" Directory of a USB device or a writeable CD/DVD.

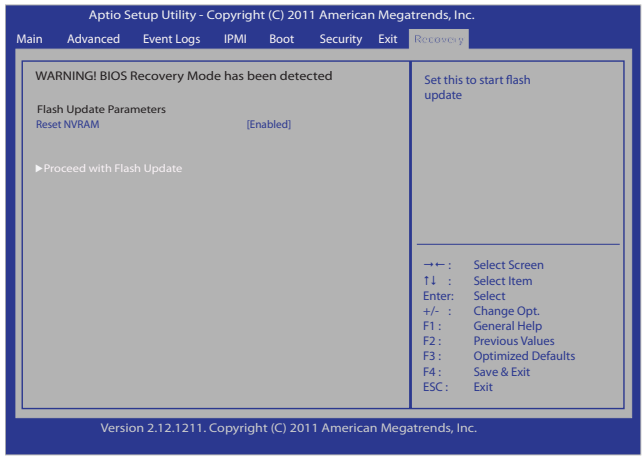
Note: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS image into a USB flash device and rename it to "Super ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super. Rom") into your USB drive and power on the system

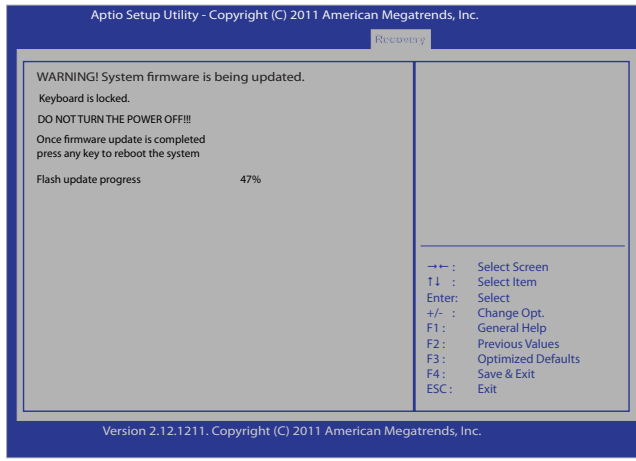
3. While powering on the system, keep pressing <Ctrl> and <Home> simultaneously on your PS2 or USB keyboard until your hear two short beeps. This may take from a few seconds to one minute.

4. After locating the new BIOS binary image, the system will enter the BIOS Recovery page as shown below.

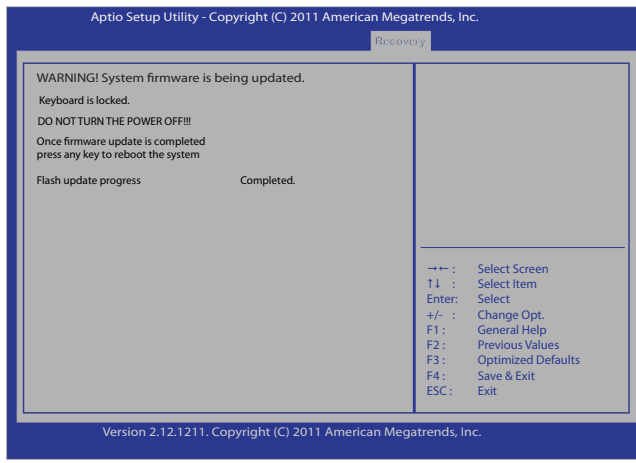
Note: At this point, you may decide if you want to start with BIOS Recovery. If you decide to proceed with BIOS Recovery, follow the procedures below.



5. When the screen as shown above displays, using the arrow key, select the item- "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS Recovery as shown in the screen below.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Recovery
WARNING! System firmware is being updated.
Keyboard is locked.
DO NOT TURN THE POWER OFF!!!
Once firmware update is completed
press any key to reboot the system
Flash update progress 47%
→←: Select Screen
↑↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit
Version 2.12.1211. Copyright (C) 2011 American Megatrends, Inc.

Note: *Do not interrupt* the process of BIOS flashing until it is completed.


Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
Recovery
WARNING! System firmware is being updated.
Keyboard is locked.
DO NOT TURN THE POWER OFF!!!
Once firmware update is completed
press any key to reboot the system
Flash update progress Completed.
→←: Select Screen
↑↓ : Select Item
Enter: Select
+/- : Change Opt.
F1 : General Help
F2 : Previous Values
F3 : Optimized Defaults
F4 : Save & Exit
ESC : Exit
Version 2.12.1211. Copyright (C) 2011 American Megatrends, Inc.

6. After the process of BIOS Recovery is complete, press any key to reboot the system.

7. Using a different system, extract the BIOS package into a bootable USB flash drive.

8. When a DOS prompt appears, type AMI.BAT BIOSname.### at the prompt.

Note: *Do not interrupt* this process until BIOS flashing is completed.

9. After seeing the message that BIOS update is completed, unplug the AC power cable to clear CMOS, and then plug in the AC power cable to power on the system.

10. Press <Del> continuously to enter the BIOS Setup utility.

11. Press <F3> to load default settings.

12. After loading default settings, press <F4> to save the settings and exit the BIOS Setup utility.

Appendix C

System Specifications

Processors

Intel Xeon E5-2600 / 1600 Series Processor Socket R (LGA 2011).

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel C602

BIOS

32 Mb SPI AMI BIOS® SM Flash BIOS

Memory Capacity

Eight (8) DIMM slots support up to 256GB of DDR3 Unbuffered, ECC RDIMM memory or 64GB of DDR3 Unbuffered, non-ECC UDIMM memory, up to 1600MHz

Note: See the memory section in Chapter 5 for details.

SATA Controller

Intel on-chip controller for two-port SATA 3.0 (RAID supported)

Drive Bays

Eight drive bays to house four 3.5" and four 2.5" optional SATA drives

Peripheral Drive Bay

Two 5.25" drive bays

Expansion Slots

Supports the use of five standard size PCI add-on cards: two PCI-E 3.0 x16, one PCI-E 3.0 x4 in x8 slot, one PCI-E 2.0 x4 in x8 slot and one PCI 33MHz slot.

Motherboard

X9SRA, Dimensions: 12" x 9.6"

Chassis
SC732D4-903B Form Factor: Mid-tower
Dimensions (WxHxD) 7.6 x 16.7 x 20.68 in. (193 x 424 x 525.3 mm)

Weight
Gross (Bare Bone): 39 lbs. (17.7 kg.)

System Cooling
One (1) 12-cm low-noise exhaust fan
One (1) active CPU heatsink (optional)

System Input Requirements
AC Input Voltage: 100-240 VAC
Rated Input Current: 12A - 6A
Rated Input Frequency: 50-60 Hz

Power Supply
Rated Output Power: 900W AC 80 Plus Gold Level multi output power supply (Part# PWS-903-PQ)
Rated Output Voltages: +3.3V (25A), +5V (25A), +12V1 (25A), +12V2 (25A) +12V3 (25A)+12V4 (25A), -12V (0.5A), +5Vsb (3A)
Power Supply Efficiency Rating: 94% (peak)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 60º C (-40º to 148º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions: FCC Class B, EN 55022 Class B, EN 61000-3-2/-3-3, CISPR 22 Class B

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)
Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes

(continued from front)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.